

DISTINGUISHED
STAFF FELLOWS
AT ORNL



Huan Zhao

Eugene P. Wigner Fellow

Where and when did you earn your PhD?

I earned my PhD from the Department of Electrical Engineering at the University of Southern California in 2019.

What was the subject of your dissertation?

The subject of my dissertation was “2D Layered Materials: Fundamental Properties and Device Applications.”

What was your dissertation’s major contribution to your field?

My contribution includes the invention of the world’s most energy-efficient resistive memory device and the discovery of a material with the largest broadband optical birefringence.

Who is your ORNL mentor and which group and division are you working in?

My mentors at ORNL are An-Ping Li, Benjamin Lawrie, and Stephen Jesse. I am part of the Scanning Tunneling Microscopy Group within the Center for Nanophase Materials Sciences.

What will your fellowship research focus on?

My fellowship research will focus on quantum state transduction and quantum sensing. This work aims to bridge the gap between innovative quantum materials and quantum information technologies.

What is your project’s expected contribution to your field?

The expected contribution of my project is the development of key elements essential for building a quantum network.

What are your research interests?

My research interests lie in the realm of quantum technologies, which have the potential to revolutionize our methods of communication, computing, and sensing.

What led you to science and your specific discipline?

I majored in physics during my undergraduate studies, then transitioned to electrical engineering for my PhD. I have also worked as a postdoctoral scholar in medical engineering. It was my curiosity and a firm determination to effect change in the world through science and technology that led me to my chosen fields.

What did you do before coming to ORNL?

Before joining ORNL, I served as a postdoctoral scholar at Caltech, where I focused on optical imaging. Prior to this, I held the position of Director's Postdoctoral Fellow at Los Alamos National Laboratory.

Could you share an interesting fact or two about yourself?

I am a proud father of two adorable cats, one black and one white, both adopted from shelters. Outside of my research work, I enjoy engaging in outdoor activities like road biking, skiing, and hiking."

What nonscience topic or activity is important to you and why?

Education equity, the principle of providing everyone access to high-quality educational resources, is a topic of great importance to me. While advancements in science and technology drive humanity's progress, fundamental education is key to raising the baseline. It empowers ordinary individuals to live with greater convenience and dignity.

